Appendix D

Terrestrial Ecological Evaluation

Terrestrial Ecological Evaluation

Chevron Site No. 30-2095
Former Chevron Bulk Terminal
149 and 167 Main Avenue
Morton, Washington

1.0 INTRODUCTION

This Terrestrial Ecological Evaluation (TEE) is conducted pursuant to MTCA (WAC 173-341-7490 through 7494). According to the regulation, a TEE is conducted for the following purposes:

- To determine if the existence of hazardous substances at a site could harm terrestrial plants or animals

- To identify and characterize the existing or potential threats to the biota that may be exposed to hazardous substances in the soil.

- To establish cleanup levels to protect biota as well as the ecologically important functions of the soil biota.

The TEE process consists of a number of sequential steps which are described in Sections 2.0 and 3.0. As presented in MTCA guidance, each step in the evaluation has associated with it one or more analytical worksheets. These worksheets comprise the evaluation and are represented in this document by Tables 1 through 3 (below). Section 4 presents the outcome of the TEE for the present site.

2.0 DETERMINE IF A TERRESTRIAL ECOLOGICAL EVALUATION IS NEEDED

Certain circumstances at a site may provide a primary exclusion from the requirement for further ecological evaluation either because on-site contaminants have no pathway to biota, because there is insufficient habitat for significant biota to exist, or because contaminants do not occur at concentrations harmful to biota. If any of these situations is present at a site, the site qualifies for a primary exclusion and the TEE is complete.

The evaluation of the present site for a primary exclusion is presented in Table 1. Based on the results of this evaluation, the site does not qualify for a primary exclusion and must be evaluated further by conducting either a simplified TEE or a site-specific TEE. The following step determines which of these to types of evaluations are appropriate.

3.0 DETERMINE IF SITE-SPECIFIC EVALUATION IS REQUIRED

The type of TEE (simplified or site-specific)that is applicable depends on four primary concerns about a site in relation to terrestrial ecological receptors. If none of these situations of concern

are applicable at the site, then a simplified TEE is adequate. Table 2 presents the evaluation to determine if the site qualifies for a simplified TEE or whether a site-specific TEE is required. The results of this evaluation indicate that the site qualifies for a simplified TEE as none of the four criteria are applicable to the present site.

4.0 SIMPLIFIED TERRESTRIAL ECOLOGICAL EVALUATION

The purpose of the simplified TEE process is to identify those sites that do not have a substantial potential for posing a threat of significant adverse effects to terrestrial ecological receptors and thus eliminate such concerns from consideration during the site cleanup process. For those sites that have the potential to pose threats to ecological receptors, the process provides default numerical concentrations that must be considered during the development of cleanup levels. The regulation also allows for site-specific levels to be developed using bioassays or by conducting other site-specific evaluations.

The simplified TEE evaluations uses numerical scoring approach that focuses on the extent of the potential exposure, the exposure pathways present, and the presence of particularly toxic contaminants.

Table 1
Evaluation of Site for Primary Exclusion from Terrestrial Ecological Evaluation

No.	Exclusion Criteria	Yes/ No	Analysis	Notes
1	Will soil contamination be located between 6 feet and 15 feet beneath the ground surface?	Yes	Soil contamination is currently located within 6 feet of the ground surface. Cleanup activities are anticipated to remove most soil contamination at the site; however, it is likely that some limited areas of contamination at 6 – 15 ft bgs will remain in inaccessible areas (e.g., beneath permanent structures, excavation sideslopes, roadways, and/or rail road tracks).	Remedial measures that include leaving contaminated soil on site at a depth of less than 15 feet must include institutional controls.
	Will soil contamination be located at 15 feet or more beneath the ground surface?	No	Soil contamination has been detected below 6 feet; however, contamination has not been detected below 15 feet below ground surface.	
	Will soil contamination be located below the conditional point of compliance?	Yes	No conditional point of compliance has currently been established; the default point of compliance for terrestrial biota of 6 feet is assumed. Cleanup activities are anticipated to remove soil contamination at the site; however, it is likely that some limited areas of contamination at 6 – 15 ft bgs will remain in inaccessible areas (e.g., beneath permanent structures, roadways, and/or rail road tracks).	Remedial measures that include leaving contaminated soil on site at a depth of less than 15 feet must include institutional controls to limit excavation of contaminated soil.
2	Will soil contamination be covered by buildings, paved roads, pavement, or other physical barriers that will prevent plants or wildlife from being exposed?	No	Cleanup activities are anticipated to remove most soil contamination at the site; however, it is possible that some limited areas of contamination may remain in unexcavatable areas (e.g., sideslopes) that may not be located beneath buildings, roads, or other barriers.	Remedial measures that include leaving contaminated soil on site at a depth of less than 15 feet must include institutional controls to limit excavation of contaminated soil.
3	Is there less than 1.5 acres of contiguous undeveloped land on the site, or within 500 feet of any area of the site affected by hazardous substances *other* than chlorinated dioxins or furans, PCB mixtures, DDT, DDE, DDD, aldrin, chlordane, dieldrin, endosulfan, endrin, heptachlor or heptachlor epoxide, benzene hexachloride, toxaphene, hexachlorobenzene, pentachlorophenol, or pentachlorobenzene?	No	The site and contiguous area beyond it encompass more than 1.5 acres of undeveloped land.	
4	Are concentrations of hazardous substances in the soil less than or equal to natural background concentrations of those substances at the point of compliance?	No	Soil contamination exists at levels greater than natural background concentrations.	

Table 2
Evaluation of Site to Qualify for Simplified Terrestrial Ecological Evaluation

Evaluation Criteria	Yes/No	Analysis
Are the concentrations of all soil contaminants of concern at the site below the ecological indicator concentrations listed in Table 749-3?	No	DRO and GRO at the site exceed the values listed in Table 749-3.
Is the site located on or directly adjacent to an area where management or land use plans will maintain or restore native or semi-native vegetation? (This includes, for example, green-belts, protected wetlands, forestlands, locally designated environmentally sensitive areas, open space areas managed for wildlife, and some parks or outdoor recreation areas. This does not include park areas used for intensive sport activities such as baseball or football.)	No	Information from Lewis County does not identify any specific land use classifications or plans whose objective is to maintain or restore native or semi-native vegetation on the site property.
Is the site used by a threatened or endangered species? Is the site used by a wildlife species classified by the state department of fish and wildlife as a "priority species" or "species of concern" under Title 77 RCW? ("Used" means that individuals of a species have been observed to live, feed, or breed at the site.) Is the site used by a plant species classified by the Washington State Department of Natural Resources natural heritage program as "endangered," "threatened," or "sensitive" under Title 79 RCW? ("Used" means that a plant species grows at the site or has been found growing at the site.)	No	The site is highly disturbed and mostly occupied by buildings, driveways, a parking area, and bare ground. The margins of the site that do not abut roads or streets contain invasive non-native vegetation (e.g., Himalayan blackberries).
Is the site (area where the contamination is located) located on a property that contains at least 10 acres of native vegetation within 500 feet of the site (where the contamination is located)? (Do not include vegetation beyond the property boundary.)	No	The property on which the site is located is less than 10 acres in size.
Has the department determined that the site may present a risk to significant wildlife populations?	No	The department has not determined that the site may present a risk to significant wildlife populations.

Table 3
Simplified Terrestrial Ecological Evaluation

Analysis Type	Criteria	Analysis
Exposure Analysis	Is the total area of soil contamination at the site less than or equal to 350 square feet?	No. The area of soil contamination is larger than 350 square feet.
	Does land use at the site and surrounding area make substantial wildlife exposure unlikely?	Yes. The site is commercial in nature, mostly cleared of vegetation, and highly disturbed. Substantial wildlife exposure is unlikely.
Pathway Analysis	Is there an absence of potential exposure pathways from soil contamination to soil biota, plants, or wildlife?	There are currently exposure pathways to plants, soil organisms, and wildlife. Site cleanup activities are expected to remove contaminated soil throughout most accessible portions of the site.
Toxicity Analysis	No hazardous substances listed in Table 749-2 for which a value is listed is, or will be, present in the soil at the point of compliance, at a concentration exceeding the value in Table 749-2, using the statistical compliance methods described in WAC 173-340-740(7). If a hazardous substance listed in Table 749-2 does not have a value listed, then Criteria 5 is applicable.	There are concentrations of GRO and DRO that are greater than the values provided in WAC Table 749-2.
	No hazardous substances listed in Table 749-2 for which a value is listed is, or will be, present in the soil within 6 feet of the ground surface (conditional point of compliance) at concentrations likely to be toxic, or with the potential to bioaccumulate, based on bioassays using methods approved by the department.	GRO and DRO concentrations in Table 749-2 are present within 6 feet of the ground surface.

Table 4
Simplified Terrestrial Ecological Evaluation-Exposure Analysis Procedure

Criteria	Score
Estimate the area of contiguous (connected) undeveloped land on the site or within 500 feet of any area of the site to the nearest 1/2 acre (1/4 acre if the area is less than 0.5 acre). 1) From the table below, find the number of points corresponding to the area and enter this number in the field to the right. **Area (acres) — Points** 0.25 or less — 4 0.5 — 5 1.0 — 6 1.5 — 7 2.0 — 8 2.5 — 9 3.0 — 10 3.5 — 11 **4.0 or more — 12**	***12***
2) Is this an industrial or commercial property? If yes, enter a score of 3. **If no, enter a score of 1.**	3
3) Enter a score in the box to the right for the habitat quality of the site, using the following rating system. High=1 Intermediate=2 Low=3	3
4) Is the undeveloped land likely to attract wildlife? If yes, enter a score of 1 in the box to the right. If no, enter a score of 2.	2
5) Are there any of the following soil contaminants present: Chlorinated dioxins/furans, PCB mixtures, DDT, DDE, DDD, aldrin, chlordane, dieldrin, endosulfan, endrin, heptachlor, benzene hexachloride, toxaphene, hexachlorobenzene, pentachlorophenol, pentachlorobenzene? If yes, enter a score of 1 in the box to the right. If no, enter a score of 4.	4
6) Add the numbers in the boxes on lines 2–5 and enter this number to the right. If this number is larger than the number in the box on line 1, the simplified evaluation may be ended.	***12***